GEOGRAPHIC NEWS BULLETINS

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(The National Geographic Society is a scientific and educational Society, wholly altruistic, incorporated as a non-commercial institution for the increase of geographic knowledge and its popular diffusion. General Headquarters, Washington, D. C.)

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Photograph by Donald B. MacMillan

FAR FROM THE UNITED STATES, CLOSE TO ITS WEATHER

The meteorological expedition camping at Reindeer Point, near Etah on the west coast of North Greenland, reported permanent atmospheric conditions that funnel the cold weather down into the United States. Among the expedition's neighbors are Greenland Eskimos in their fur suits, and a rare species of white wolf (Bulletin No. 2).

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic News Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers in the United States and its possessions for one year upon receipt of 25 cents (stamps or money order); in Canada, 50 cents. Entered as second-class matter, Jan. 27, 1922, Post Office, Washington, D. C., under act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103, Act of Oct. 3, 1917, authorized Feb. 9, 1922. Copyright, 1939, by National Geographic Society, Washington, D. C. International copyright secured. All rights reserved. Quedan reservados todos los derechos.

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General Headquarters, Washington, D. C.

Somaliland Is France's "Railroad Station" Colony

WARSHIPS and troops were rushed from France to French Somaliland and its one important port, Djibouti, recently in response to rumors of Italian troops massing along the border of this small African colony.

"The French Coast of the Somalis" is what the French call it, and indeed it is little more than a bite into the coastline. It represents one tenth of one per cent of the African territories under French rule, which aggregate almost half the Dark Continent. Yet it has a high strategic value because of its commanding position on the Red Sea, because of Djibouti—the only good port on 2,000 miles or more of northeast African coast—and because of the railroad to Addis Ababa. The only port comparable to Djibouti in usefulness is Italian Massua, 400 miles to the northwest in Eritrea, and that has no railroad extending far inland.

French Watch-Dog at the Gate of Tears

With an area of 5,800 square miles, French Somaliland is the smallest by far of the three portions into which the realm of the Somalis was divided by European powers; the British protectorate is ten and a half times as large, the Italian thirty-three times as large. Throughout the French colony there is no river of importance to refresh the parched land. Temperature is high, humidity low. The seasons change only from "bearable" to "unbearable," as the monsoon dies down and its freight of scant rainfall ceases to relieve the unbroken bake-oven heat. Few gardens are productive except those underseas; fishermen search the gardens of black, red, and white coral for fish to accompany their fermented bread of durra (grain sorghum) meal.

For France, however, her barren little share of Somaliland plays a big role. It stands guard on the Strait of Bab-el-Mandeb, the dangerous "Gate of Tears" where the Red Sea narrows to 100 miles and commerce could be easily strangled by a hostile hand. It is the only patch under the French tri-color on the entire coast of northeast Africa, the only one between Tunisia in the Mediterranean and Madagascar in the Indian Ocean over 5,000 miles away. Djibouti is a coaling station for shuttle ships that weave Madagascar, French Indo-China, and distant Pacific possessions into the empire tapestry with Marseilles and the motherland.

Railroad Furnishes Chief Income from Colony

Moreover, French Somaliland is the sole safeguard for French interests in a part of Africa turbulent with native feuds and the conflict of European ambitions as well. Italian conquests in Ethiopia have cleared a broad band of "Roman Empire" across the Eastern Horn of Africa, from Eritrea to the Italian Somaliland coast, and crowded France and Britain out to the tip. Only four years ago the tiny French colony ceded 309 square miles to Italian sovereignty in Eritrea.

Of the 46,000 inhabitants, fewer than 2,000 are European. Over half are Somali natives, and a fourth are Danakil, of the tall and bony black tribe whose members dominate the coast to the north as the Somalis do to the south.

Since the French laid claim to the now abandoned port of Obock across the Gulf of Tadjoura from Djibouti, as early as 1867, they have made little effort to colonize or to exploit the hard-baked country. A few bales of cotton, some coffee, the few hides and skins that black nomads of the desert interior can spare from their meager flocks—even irrigation has been able to extract no more from the

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Photograph by Bradford Washburn

HE SAW MORE GLACIAL ICE IN A DAY THAN ALL EUROPE CONTAINS

In August, 1938, Bradford Washburn flew over and photographed the largest glacial "ice bowl" yet to be mapped outside the polar regions. The overflow from the ice reservoir spreads glaciers along the Chugach Mountain range in southwestern Alaska for about 250 miles. His bulky Fairchild aerial survey camera can take 110 photographs, 7-by-9 inches, in rapid succession without reloading, and the pictures can afterward be fitted together with nearly maplike continuity. Washburn made his discovery in the process of investigating, for the National Geographic Society and the Harvard Institute of Geographical Exploration, one of the last unmapped spots in Alaska. He also scaled Mt. Sandford, which was up to that time the highest unclimbed peak in North America (Bulletin No. 2).

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Explorers of 1938 Cleared Up Some of World's Remaining "Blind Spots"

ARCTIC and near-Arctic regions were the scenes of greatest activity during 1938 in man's efforts to round out his knowledge of the earth. Explorers also penetrated little-known areas in South America, Asia, New Guinea, and Antarctica.

The largest "ice reservoir" and glacial system which has been definitely observed and photographed outside the polar regions was found in southwestern Alaska in August. The vast ice field was discovered from the air by Bradford Washburn, who was conducting studies for the National Geographic Society and the Harvard Institute of Geographical Exploration (illustration, inside cover). The ice mass, which is the source of a dozen or more large glaciers, lies approximately 250 miles northwest of Juneau. It has a length of approximately 250 miles and varies in width from 20 to 30 miles.

During an expedition of many months in search of Sigismund Levanevsky and five Russian associates who were lost while flying in the Arctic, Sir Hubert Wilkins explored approximately 170,000 square miles of the Arctic Ocean never before seen by man. He reported that there is no land in the Beaufort Sea and the area westward to the 170th degree of Longitude West, between the northern edge of the North American Continent and the North Pole.

Fata Morgana Islands A Myth

Another definite report of "no land" came from Dr. Lauge Koch, leader of the Danish Greenland Expedition who, after an eleven-and-a-half-hour flight, found only water between Spitsbergen and Peary Land, the latter the northernmost tip of Greenland. The area was the supposed location of the mysterious "Fata Morgana Islands." Dr. Koch also discovered that Peary Land, with the Roosevelt Range, is almost an island, being nearly separated from the rest of Greenland by the close approach of the heads of Hyde and Frederick Fjords.

In her sixth expedition to the Arctic, Louise Boyd, with a party of six, under the auspices of the American Geographical Society, worked her way during the summer up the eastern coast of Greenland, reaching the farthest north on that coast attained by an American by ship. In Longitude 17° 10′ West, she reached Latitude 77° 50′ North, which is the second highest latitude reached by a vessel in these waters. Magnetic, tide, and current observations and soundings were made, and map-making and geological studies were carried on.

Clifford J. MacGreggor, U. S. Government meteorologist at Newark Airport, and a party of twelve, in October, 1938, completed a 15½-months' expedition to the Arctic to study meteorological conditions. From a base camp established at Reindeer Point, Greenland, near Etah (illustration, cover), weather observations were made every hour of the day and night. The expedition found a permanent atmospheric low pressure area and a steady drift of polar air masses through the "low," which brings cold air and cold weather to the United States. Upper air soundings were taken by means of balloons with meteorographs attached.

As the result of observations during a flight on May 12-13, Commander Isaac Schlossbach, navigator and pilot of this expedition, reached the conclusion that the mythical "Crockerland" (supposed to lie northwest of Ellesmere Island) does not exist.

Venezuelan Waterfall with Mile Drop Discovered

On February 19, 1938, Ivan Papanin and his three companions, members of the U.S.S.R. North Pole Expedition, were rescued by icebreakers from the ice floe on which they had drifted 1,560 miles since May 21, 1937, while studying Arctic weather conditions and making soundings of the Arctic Ocean.

A British Arctic Expedition discovered an island 200 square miles in area, between Amund Ringnes Island and Axel Heiberg Island.

Under the leadership of Alex King, scientists from the Imperial College of Science, London, made the first circuit of Jan Mayen Island, which is situated in the Greenland sea, east of Greenland. Dr. Adolf Hoel completed an air survey of the Svalbard Archipelago (Spitsbergen), north of Norway.

Leading his fourth Antarctic Expedition, Lincoln Ellsworth, with Sir Hubert Wilkins as lieutenant, sailed from Capetown, October 29, 1938, in the *Wyatt Earp* for Enderby Land, on the Antarctic continent.

In June, Richard Archbold and his research associates, collaborating with the American Museum of Natural History, established a base at Lake Habbema, in the heart of the unexplored mountain region of New Guinea. Another camp was set up 70 miles farther north on the

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land. The water is more productive. Pearl divers defy the sharks with hopes of a fortune in the next oyster. Salt has been mined since 1912, and the salt lake of Assal, blue in its black setting of volcanic hills, is one of the few beauty spots.

The landlocked harbor of Djibouti was made into a port after 1888. Ten years later, after an agreement with Menelik, then Negus of Ethiopia, the railroad started its slow penetration of the hinterland, replacing the camel caravans by which the wealth of Ethiopian highlands had been transported by night through the menace of desert sun and native bandits. By 1902 the rails had reached Diredawa. By 1917 they reached Addis Ababa, the capital. Trains now operate over the 486-mile track with "sailings" twice weekly in each direction, making the trip from Djibouti to Addis Ababa in 58 hours. "Expresses" improve their schedule by running at night. Others stop for meal time and bed time at stations. The sleeping cars have a variety of mattress-covered easy chairs instead of berths.

Income from the railroad and the port of Djibouti is the chief wealth that French Somaliland produces. Shares in the railroad were granted by France to Italy in 1935.

Note: Additional photographs and information about French Somaliland and its railroad life artery will be found in "Life's Tenor in Ethiopia," *National Geographic Magazine*, June, 1935; "Sailing Forbidden Coasts," September, 1931; and "Modern Ethiopia," June, 1931.

See also in the GEOGRAPHIC NEWS BULLETINS: "Djibouti Holds the Key to Ethiopia's Front Door," week of November 18, 1935.

Bulletin No. 1, January 16, 1939.

Photograph by Ewing Galloway

"SHE SHALL HAVE MUSIC WHEREVER SHE GOES"

The street dancer in Djibouti is a popular entertainer, with her crude but energetic routine, because native taste predominates in the city where only eight per cent of the population is European. The dark high hat of the belted and uniformed soldier (right) indicates that French authority is always in the background. Like many native women along the coast, the dancers wear modified Arab costumes, with veils and voluminous dresses as protection against the sun in temperatures well above a hundred degrees. The turbaned drummer steps high to his own rhythm; another player blows a primitive horn.

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Hittite Ruins and Rug-Making Mark Turkish Earthquake Area

HOME, Sweet Home has lost its charm for inhabitants of the Kirsehir region of Turkey. Some of them have appealed for resettlement to another part of the country, after living through two earthquake disasters within nine months.

Their anxiety to leave home followed the twenty-three-hour period of severe shocks that rocked their native region in December, wrecked houses, took an unknown number of human lives, and left 900 or more people homeless. That catastrophe alone might not have scared the survivors away, but it followed too closely upon the disastrous April earthquakes that wiped out whole towns.

Soft Rugs Predominantly Red and Green

Wool for some of the world's most highly prized rugs comes from the plateau region of Anatolia (the Asiatic part of Turkey), where the towns of Kirsehir and Yozgat dominate the tremor-shaken highlands. This district is located about 130 miles southeast of the new Turkish capital, Ankara (Angora). Most people will recognize the plateau as the home of the Hittites, a name commonly associated with references in the Bible to Canaanites and Amorites. The area is dotted with remains of the famous old Hittite culture which flourished thirteen centuries before Christ. Some of the sites have been excavated by American archeologists.

Kirsehir, southern center for this area, is the home of the well-known Kirsehir rugs. The arid table-land surrounding this town gives pasturage to vast roaming herds of sheep and Angora goats. The dry climate of the uplands and the short nutritious grass on which the sheep and goats feed aid these flocks in producing the finest type of wool and mohair for rug-making.

The Kirsehir rugs are noted for their softness, excellent texture, durability, elaborate designs, and beauty of color. Reds and greens predominate, but bright blues and yellows are also frequently used. The small Moslem prayer rugs made by these people are particularly well known and prized.

Yozgat Near Ruins of Hittite Capital on Anatolian Plateau

This industry brings a livelihood to many of the region's inhabitants, to whom rug and carpet-making is a family affair. Nomadic shepherds tend the flocks, carefully watching them and cutting the wool when it is ready, usually in April and May. Women and children participate in washing the wool, in preparing the brilliant dyes, in spinning the wool, and in weaving the rugs. Most of this work, even today, is carried on in the home. Young girls are early taught to weave, because rugs form an important part of their wedding dowries. Many of the finest types of rugs are made entirely by hand on home-made looms, a process which greatly enhances their value.

Much of the region affected by the earthquakes, in addition to being a sheep and goat country, is devoted to agriculture. Figs, cereal crops, nuts, tobacco, and beets for sugar are grown. Silk also is produced, and some is used in rug-weaving.

Yozgat, northern town in the earthquake region, is the road center for the surrounding district and the nearest to ancient Hittite ruins. It is situated to the northeast of Kirsehir. In appearance it is typical of many of the towns on the Anatolian plateau. Its low, flat-roofed buildings and houses, made of mud and dark wood, are dominated by a picturesque white mosque, built by and named for the Capanoglu family, who founded the town. A new Government building,

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Idenburg River, 125 miles northwest of Hollandia. Foot parties from the two camps penetrated the unknown territory and obtained rare specimens of mammals and birds.

Dr. George H. Tate, mammalogist in charge of the Phelps-Venezuelan Expedition, led a party into the unexplored, isolated tableland region of Venezuela known as Auyantepui. This plateau, covering about 45,000 square miles, and rising 3,000 to 8,000 feet above the surrounding plains, was found to contain a horde of small animals whose color markings and fur are different from their kind elsewhere, because of their long isolation.

James Angell, an American aviator, working in the same region as the expedition, but not connected with it, reported that he had sighted a waterfall higher than any hitherto known. According to measurements by means of the altimeter of his plane, the water falls 5,000 feet in one drop, then 1,000 feet. The stream drains eventually into the Orinoco River.

Also in northern South America, Dr. William H. Holden conducted a six-months' study of aboriginal Indian methods of making drugs and poisons from native plants, obtaining the most comprehensive collection ever brought out of this territory. His work was carried on in the Serra Acarahy Mountains, which mark the boundary between British Guiana and Brazil.

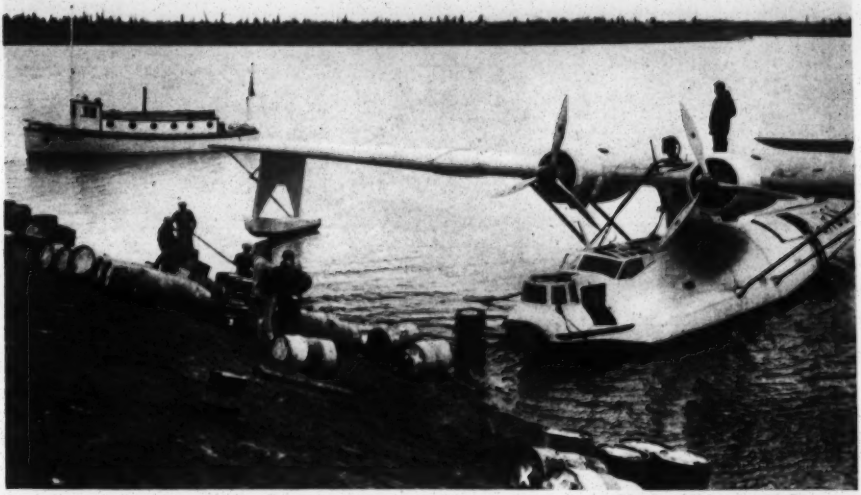
During the summer and fall of 1938, two Colorado River Expeditions in small boats successfully covered the dangerous course of 600 miles from Green River in Utah to Lake Mead, between Arizona and Nevada, impounded by Boulder Dam. One expedition was led by Norman D. Nevills and included two women botanists, Elzada Clover and Lois Jotter, of the University of Michigan, the first women ever to complete the canyon trip. Members of the other expedition were Amos Burg and Haldane Holmstrom.

Attempts during 1938 to climb three of the highest peaks in the Himalaya Mountains were unsuccessful because of weather conditions, sickness, and food shortage. A British expedition, under H. W. Tilman, attained a height of 27,300 feet in an effort to climb Mt. Everest on June 10. Charles S. Houston led a party of Americans in an assault on K-2 (Mt. Godwin Austen) as far as the 26,000-foot level before being turned back. This is the highest point ever reached on this mountain. Dr. Paul Bauer and a group of fellow Germans made five attempts to climb Nanga Parbat, but also gave up after reaching a height of 26,000 feet.

Note: See also "Our Search for the Lost Aviators," *National Geographic Magazine*, August, 1938; "Over the Roof of Our Continent," July, 1938; "My Flight Across Antarctica," July, 1936; "Flying Around the North Atlantic," September, 1934; "Aerial Conquest of Everest," August, 1933; "Into Primeval Papua by Seaplane," September, 1929; "MacMillan Arctic Expedition Returns," November, 1925; "*Bowdoin* in North Greenland," June, 1925; and "Surveying the Grand Canyon of the Colorado," May, 1924.

See also in the GEOGRAPHIC NEWS BULLETINS: "World's Largest Non-Polar Icecap Found in Alaska," week of October 3, 1938; "Unknown Corners of Canada Explored by Yukon Expedition," week of October 14, 1935.

Bulletin No. 2, January 16, 1939.



Photograph by Gerald Brown

MOONLIGHT MANHUNT IN THE ARCTIC CONSUMED 75 GALLONS OF GAS AN HOUR

Sir Hubert Wilkins scoured 170,000 square miles of hitherto unexplored Arctic Ocean for the lost Russian flyers, making the first Arctic flights by moonlight. He flew a twin-motored ship similar to those classified by the U. S. Navy for use as long-range bombers. The twin-row Wasp motors required frequent refueling from the supply of steel drums photographed here at Aklavik, Northwest Territories in the Canadian Arctic.

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Significant Engineering Projects Completed in 1938

AN IRRIGATION canal and its diversion dam in the United States, a railway in Iran (Persia), and a highway through China's "side door" from Burma rank among the world's most important engineering accomplishments of the year.

One of the most ambitious canal projects ever undertaken in the United States was completed in October, when 70 per cent of the water in the lower Colorado River was turned into the All American Canal and became, in effect, an artificial river flowing through a desert to water the fields and gardens in the Imperial Valley of southeastern California. The 80-mile canal was begun in 1934 to replace an existing channel which ran for the most part through Mexican territory. Water is diverted into the new channel 20 miles upstream from Yuma, Arizona, by the concrete Imperial Dam, also built during the past four years.

Iran Gets First Important Railway

Completion in August of the 865-mile Trans-Iran Railway connecting the Persian Gulf and the Caspian Sea, by way of Tehran, the capital, marks the accomplishment of the most important rail construction project that has been undertaken in southwestern Asia in recent years. The work has consumed seven years and has cost approximately $140,000,000. The railway is the first of any extent or importance to be laid in Iran.

The year's No. 1 highway in point of world-interest and possible international significance is the 400-mile stretch from Yunnanfu, in southwestern China, to Lashio, a railhead city in east-central Burma. The Chinese have been pushing the construction of this road for more than a year with between 150,000 and 200,000 coolies constantly at work. For considerable distances the road runs along steep slopes in a country subject to exceedingly heavy seasonal rains.

Over the new highway, supplies from Europe and America for the Chinese Government can be carried by truck with relative freedom from attack by the Japanese. The route is at no place closer than 400 miles to the Chinese coast.

Norway Extended Rail System

Railway building on an extensive scale was most active in 1938 in Manchukuo, under Japanese supervision, and in China in territory still under Chinese control. Rails were laid by Japanese from Tungchow, just east of Peiping, 105 miles to the northeastward through the Great Wall to Chengteh, capital of Jehol, and from there, northwestward for 75 miles up the Lwan River toward Dolon Nor, Chahar. In the area south of the Yangtze River and 300 to 400 miles inland, the Chinese completed 250 miles of railway, roughly parallel to the coast, between Hengchow in Hunan Province and Kweilin in Kwangsi Province.

In Norway the Southern Railway was extended for 35 miles from Nelaug to Grovane to include the seacoast section, and the narrow-gauge line 11 miles long from Grovane to Kristiansand was reconstructed into standard-gauge track, inaugurating on June 21 the eastern section of the main railway with the terminal at Kristiansand.

A 12-mile railroad connecting the port of Leixoes, Portugal, with the Minho e Douro Railway, circling Oporto, was opened in September.

In the Philippines, the last 14-mile link of the southern section of the Manila railroad was completed in January 1938. Manila and Legaspi now are connected by rail, eliminating the boat-crossing of an inlet and considerably reducing travel time.

Short sections of new railway were built in Nicaragua, Uruguay, and Chile.

Another Tunnel Pushed under Hudson

Biggest railway tunneling job completed during the year was in Japan, where the 2-mile long Ajiro-Usami bore on Izu Peninsula 70 miles south of Tokyo was holed through in May. The tunnel will reduce train time between Tokyo and Ito on the east coast.

In the United States, the already well-punctured floor of the Hudson River between Manhattan Island and New Jersey was pierced again. The north tube of the Lincoln Tunnel, 7,400 feet in length, was holed through in May. It lies beside the south tube which has been in use by traffic since December 1937.

In the far West, the most important tunnel link in the Colorado River-Pacific Coast aqueduct system, was holed through in November. The bore, which penetrates San Jacinto Mountain in Southern California, is 13 miles long.

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bazaars, native cafes, and inns line the main street, which is crudely surfaced with dirt and stones. There are few trees to be seen in this dry, windswept region.

Near this town lie the ruins of the ancient capital of the once powerful Hittite Empire, Bogazkoy. At this site, and at two others near-by, Eyuk and Alishar, excavations reveal the high culture of the ancient kingdom which flourished and was in its prime at the time the great Pharaohs were ruling in Egypt. Parts of massive city walls, well preserved gate-lions, sphinxes, eagles, and beautifully executed friezes of ancient deities have been found (illustration, below).

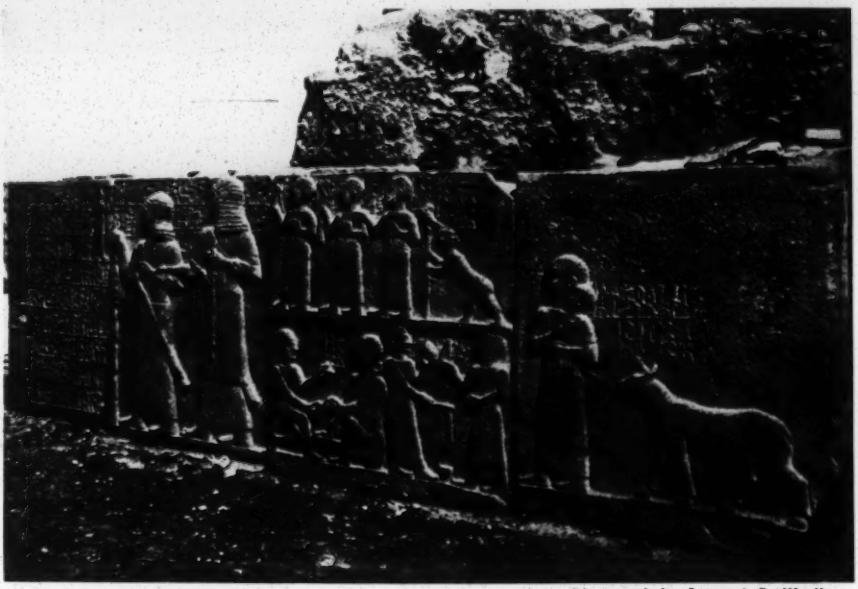
Among the most important of the relics which have been excavated, is a library of cuneiform tablets giving in detail treaties, history, records, and customs of this ancient nation. Work on these Hittite sites is still being carried on, and in time it is hoped that a complete picture of the great empire can be reconstructed.

Yozgat and Kirsehir are connected with Ankara, the capital, by cart roads which were once old caravan routes. One railroad, from Ankara to Kayseri, traverses the region, but Kirsehir lies 35 miles south of it and Yozgat 25 miles north. The life in the villages and on the plateaus is that of the simple nomad and peasant.

Note: Additional references to Anatolia will be found in "The Transformation of Turkey," *National Geographic Magazine,* January, 1939; "Looking In on New Turkey," April, 1932; "Kizilbash Clans of Kurdistan," October, 1928; "Archeology, The Mirror of the Ages," August, 1928; "Skirting the Shores of Sunrise," December, 1926; "History's Greatest Trek," November, 1925; "Crossing Asia Minor," October, 1924; "East of Constantinople," May, 1924; "The Geographical History of Asia Minor," November, 1922; and "Asia Minor in the Time of the Seven Wise Men," January, 1920.

See also in the GEOGRAPHIC NEWS BULLETINS: "Turkey Unearths Gold Mine of Croesus," week of February 25, 1935; and "The Kurds, Historic Trouble-Makers, Revolt Again," week of April 27, 1931.

Bulletin No. 3, January 16, 1939.



Photograph by Leonard C. Woolley

ANCIENT HITTITE POMP STILL PARADES THROUGH MODERN TURKEY

The region of Anatolia plagued by two earthquake disasters last year was once the home of Hittites, a people of advanced civilization some 4,000 years ago. One of their great cities was Carchemish, a site excavated by Dr. Leonard Woolley and T. E. Lawrence before the latter became involved in the revolt in the desert. This frieze at Carchemish depicts the royal family going out to welcome a victorious army. The central slab shows four Hittite princelings on their good behavior in the top half, while below they are seen tossing knuckle bones and playing whiptop. The baby and an animal pet are brought along by the nurse in the rear.

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Canary Bird: That Handful of Singing Sunshine

EIGHT thousand immigrants from a single ocean liner have started the New Year in new homes in the United States, and their protectors have paid for the privilege of adopting them. No protest was raised against their prompt naturalization, for the little aliens were canary birds. The record shipment reached New York City in time for their singing to join in the recent holiday festivities.

The canary is welcomed for bringing a touch of untamed nature into civilized homes; but there is no bird with which nature has less to do. The commonest cage bird throughout the world, the little captive by now has more relatives living indoors than out. Its color has inspired a catch phrase, "canary yellow"; yet nature made the bird a grayish olive drab, and it has been four centuries of man's efforts that transmuted it into gold. Its song trills forth like the voice of nature, but man has taught the canary to sing as he would teach a child to talk.

"Canary" Comes from Latin for Dog

All the world-scattered clan of these live music boxes have been traced back to an origin in three small groups of east Atlantic islands: the Azores, the Madeiras, and the Canaries, in an arc off the northwest coast of Africa. The chimney corner opera star owes its name to the rather barren Canary Islands, where they are the only wild creature seen in any profusion. But the islands owe their name not to birds but to dogs, which impressed explorers reaching these Atlantic outposts about the time of the birth of Christ (Latin for "dog" is *canis*). The creatures from which the Canary Islands have profited most is again not their bird namesakes, but the cochineal insect imported from Honduras over a century ago.

Nine-tenths of the birds brought into the United States each year are canaries from Germany. For the canary of commerce has not been a Canary Islands product for centuries. The song bird hobby, following the decline of the hunting falcon's popularity as a pet, boomed as soon as Columbus opened up the Atlantic to two-way traffic, and Spanish crews brought back to Europe the wild birds caught on their native Atlantic islands. Tradition tells of a storm-driven ship wrecked off the island of Elba, and survivors of a cargo of canaries starting a colony of wild songsters there; but they were hunted to extinction as the cage-bird fad gained headway in Italy. From the Italian Tyrol, traditional home of canary breeding, this musical occupation spread along the Alps into Germany, transforming Innsbruck, Nurnberg, and Augsburg into bird-musical centers.

Canary Singing Schools in German Snowclad Mountains

In 1838 a miner in the silver-mining town of St. Andreasberg in central Germany—so a local story goes—obtained some of these South German canaries to brighten the snowbound winters of his mountain home. Last year the town observed the centenary of his bird pioneers' arrival; to them is traced the famous Harz Mountain industry which now fills bird cages all over the world. Here, hard winters and deep snows encouraged the snug indoor occupation of canary nurseries. Young males learn to copy the rich rolling trills of adult songsters. Some canary finishing schools offer a postgraduate course based on sound recordings of the nightingale's song.

The Harz Mountain equivalent of the American horse show is a canary singing tournament, such as the annual birdsong-fest at Benneckenstein, for which the

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New Bridges Tie U. S. to Canada

Two international bridges, linking the United States and Canada, were completed during the year. The 90-foot span of the Thousand Islands International Bridge—nicknamed "the Biggest Little Bridge in the World"—was opened August 18. This short bridge, between two islands in the St. Lawrence River, is the international link in the highway project crossing the river and four islands of the Thousand Islands. The entire project, extending between Collins Landing, New York, and Ive Lea, Ontario, consists of five separate bridges and 8½ miles of approaches and connecting roadways.

The Blue Water International Bridge from Port Huron, Michigan, to Sarnia, Ontario, over the St. Clair River, was dedicated by representatives of Michigan and Ontario. The cantilever type bridge has an overall length of 8,120 feet.

The Lion's Gate Bridge over the First Narrows, Vancouver Harbour, Canada, was completed in November. It has a main span of 1,500 feet between two concrete towers, and an overall length of 5,675 feet.

A new bridge across the River Jordan linking Palestine with Trans-Jordan was opened to traffic in May. It is east of Jericho on the road to Amman, Trans-Jordan.

Dams for Irrigation, Power, and River Regulation

Man's long task of harnessing rivers continued throughout the world. In the province of Sind, India, an irrigation dam across the Indus River was completed in April. In the province of Cordoba, Argentina, finishing touches were added to one of South America's greatest dams and power plants, on the Tercero River. It is 164 feet high and 1,180 feet long. The dam regulates the river's flow and furnishes a reservoir for irrigating an area of 150,000 acres.

Besides the Imperial Dam on the Colorado River, dams reaching completion in the United States in 1938 included the Alcova diversion dam on the North Platte River at the mouth of Alcova Canyon, near Casper, Wyoming; Alamogordo Dam in the Pecos River, near Fort Sumner, New Mexico; Caballo Dam, also in New Mexico, in the Rio Grande, below Elephant Butte Dam; Unity Dam in the Burnt River in eastern Oregon; and T.V.A.'s Pickwick Landing Dam, Tennessee.

South America Active in Highway Building

Highway construction was notable in South America. In Peru work was completed on an automobile and freight highway more than 500 miles long from Lima on the Pacific coast up the Andes Mountains, over 16,000-foot La Viuda Pass, and down through dense jungles to the all-season port of Pucalpa on the lower Ucayali River. Freight from the Pacific coast, after passing over the new highway, can then go by steamer down the Ucayali into the Amazon River, and on to Atlantic seaports of South America.

Germany, already plentifully supplied with canals, completed during the year its most extensive system, the 295-mile Midland Canal. It has been under construction off and on since 1906 and now connects the Oder, Elbe, Weser and Rhine Rivers, making it possible to travel through middle Germany from the Baltic Sea to The Netherlands and the English Channel. To overcome the difference in water levels of the rivers, ship elevators, locks, and sluices have been built and in several places the waterway is carried by water bridges.

In the field of military engineering, one of the most important developments of the year was completion of the $48,675,000 Singapore Naval Base. Great Britain's "Gibraltar of the East." The "King George VI Dry Dock" at the base is capable of accommodating the largest warships afloat.

List of "Subway Cities" Grows

The new port of call for passenger ships at Tel Aviv, Jewish city in Palestine, was inaugurated on February 23, by the High Commissioner for Palestine. The port was begun in 1936.

In the small group of "subway cities" of the world, extensions to underground transit systems were made in Moscow, Osaka, and Buenos Aires. Work was started during the year which will add Chicago, Munich, and Santiago, Chile, to the group.

In the United States, the last gap of 80 miles over bridges and tiny coral keys of "the highway that goes to sea" from the mainland of Florida to Key West was completed and opened to traffic in April. One bridge on the highway is seven miles in length. This Overseas Highway forms the last link in U. S. Route No. 1 along the Atlantic coast from Calais, Maine, to Key West, Florida.

With the 221-mile stretch through open farm country from Memphis, Tennessee, to Jackson, Mississippi completed, the first all-paved highway linking the Great Lakes and the Gulf of Mexico, was opened in January, 1938.

A vehicular bridge across the Ohio River at Cairo, Illinois, was finished in November. This bridge and the one built several months earlier across the Mississippi River at Cairo make possible quick communication between all parts of the middle Mississippi and lower Ohio Valleys.

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whole neighborhood turns out to hear and judge the artful caroling of songsters invisible in covered cages.

A Human "Canary" Would Hold Note for Five Minutes

The bird musician is trained to develop a variety of trills, called "tours" and "rolls," and fancifully named; such as, the Water Roll, Bell Roll, Hollow Roll. A truly operatic canary may have five or ten of these in his repertoire; a genius's vocal fireworks may include as many as fourteen.

A human singer with power in proportion to a canary's would be able to hold a tone for five minutes without interruption for breathing. For the feathered vocalist can sing continuously through time for 70 to 90 breaths.

In four centuries of domestication, the canary family has adjusted to indoor life, changing habit along with habitat, just as man has changed in moving from cave to house. Green is a color of concealment in nature, blending with leafy background. But as a captive under man's protection and guidance, the canary has discarded its cautious coat of wild gray-green and flaunts a garb of alluring gold. Special color effects distinguish the Lizard canary, with a pattern of bold V's marking his plumage, and the Cinnamon, a pink-eyed brownish songster with white wing and tail feathers. The crescent shape of the Scotch Fancy, the "broken-back" silhouette of the Belgian Fancy, the curly feathers of the Frilled, and the fluffy feather "mop" of the Crested are unusual features which these members of the canary family have acquired through careful selective breeding.

Note: See also "Canaries and Other Cage-Bird Friends," *National Geographic Magazine*, December, 1938; "Belgium—Europe in Miniature," April, 1938; "European Outpost: The Azores," January, 1935; "Madeira the Florescent," July, 1934; and "Hunting for Plants in the Canary Islands," May, 1930.

Bulletin No. 5, January 16, 1939.

Photograph by Ewing Galloway

YEARLY THOUSANDS OF CANARIES ARE EXPORTED IN "STICKS" OF CAGES

Tiny wooden cages, stacked so high that they hide their carriers, are handled in "sticks" —each stick a row held together on a rod thrust through six or seven cages, and secured at the ends with wooden pins. Germany, at the rate of some 145,000 per year, sends sixteen times as many canaries to the United States as the next quantity exporter, Great Britain. Most of the German songsters are valued at about two dollars apiece.

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